

Section 3.2 Polynomial Functions of Higher Degree

Objective: In this lesson you learned how to sketch and analyze graphs of polynomial functions.

Course Number

Instructor

Date

Important Vocabulary

Define each term or concept.

Continuous

Repeated zero

Multiplicity

Intermediate Value Theorem

I. Graphs of Polynomial Functions (Pages 265–266)

Name two basic features of the graphs of polynomial functions.

- 1)
- 2)

Will the graph of $g(x) = x^7$ look more like the graph of $f(x) = x^2$ or the graph of $f(x) = x^3$? Explain.

What you should learn

How to use transformations to sketch graphs of polynomial functions

II. The Leading Coefficient Test (Pages 267–268)

State the **Leading Coefficient Test**.

What you should learn

How to use the Leading Coefficient Test to determine the end behavior of graphs of polynomial functions

Example 1: Describe the right-hand and left-hand behavior of the graph of $f(x) = 1 - 3x^2 - 4x^6$.

III. Zeros of Polynomial Functions (Pages 269–271)

On the graph of a polynomial function, turning points are . . .

Let f be a polynomial function of degree n . The graph of f has, at most, _____ turning points. The function f has, at most, _____ real zeros.

Let f be a polynomial function and let a be a real number. List four equivalent statements about the real zeros of f .

- 1)
- 2)
- 3)
- 4)

If a polynomial function f has a repeated zero $x = 3$ with multiplicity 4, the graph of f _____ the x -axis at $x = 3$.

If a polynomial function f has a repeated zero $x = 4$ with multiplicity 3, the graph of f _____ the x -axis at $x = 4$.

Example 2: Sketch the graph of $f(x) = \frac{1}{4}x^4 - 2x^2 + 3$.

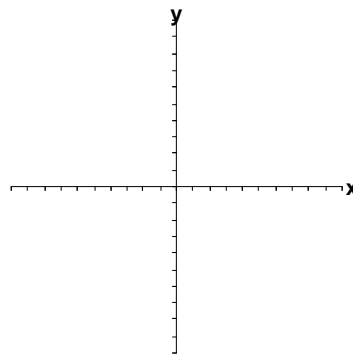
IV. The Intermediate Value Theorem (Pages 272–273)

Explain what the Intermediate Value Theorem implies about a polynomial function f .

Describe how the Intermediate Value Theorem can help in locating the real zeros of a polynomial function f .

What you should learn

How to use zeros of polynomial functions as sketching aids

***What you should learn***

How to use the Intermediate Value Theorem to help locate zeros of polynomial functions

Homework Assignment

Page(s)

Exercises